REMARKS

In response to the Office Action of July 22, 2008, claims 1, 15-17, 19-21 and 26 have been amended.

Claims 1, 15-17, 19-21 and 26 have been amended to correct informalities.

Claim 26 has been amended to recite a "memory" in place of a "computer readable medium." Support for this amendment can be found in the application as filed, including at page 18, lines 24-32.

Specification

At page 3 of the Office Action, the specification is objected to as failing to provide proper antecedent basis for the claimed subject matter in claim 26 with respect to the phrase "computer readable medium." In the Advisory Action mailed on September 29, 2008, the Office argued that applicant's amendment of September 22, 2008 with respect to claim 26; namely, amending the claim from a "computer readable medium" to a "memory", raised new issues. Consequently, the amendment of September 22, 2008 was not entered.

This issue is moot in view of the current amendment being submitted with a Request for Continued Examination. Appropriate amendment has been made to claim 26, by replacing "computer readable medium" with the word "memory," which is shown in the drawings (see Figure 2) and which is discussed in the specification (see, for example, page 9, lines 22-31). Therefore it is respectfully submitted that the claim 26 has proper antecedent basis for the term used.

Claim Rejections- 35 USC § 103

At page 3 of the Office Action, claims 1-3, 8-10 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Atal (US 4,133,976) in view of Tasaki (US 6,526,378).

With respect to claim 1, it is asserted that Atal discloses a method of filtering a speech signal, the method involving the steps of providing a filter suited for reduction of distortion caused by speech coding, predicting acoustic noise in said speech signal,

adapting said filter in response to the predicted acoustic noise to obtain an adapted filter, and applying said adapted filter to said speech signal so as to reduce acoustic noise and distortion caused by speech coding in said speech signal, with reference made to column 9, lines 20-25 and 35-57 of Atal. While Atal does not disclose estimating background acoustic noise, it is further asserted that this feature is disclosed by Tasaki, with reference made to column 6, lines 15-17. Thus, it is asserted by the Office that it would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Atal, and use estimating acoustic noise by Tasaki. Applicant respectfully disagrees.

In claim 1, the action of applying said adapted filter to said speech signal is not only to reduce distortion, including quantization noise, associated with speech coding, but also to reduce background acoustic noise. Thus, claim 1 makes clear what is believed to be an inventive feature of the present invention; namely, that both background acoustic noise, (see page 4, lines 26-28 of the specification), and quantization noise associated with coding, are jointly handled by the claimed method. This is accomplished by estimating the background acoustic noise in the speech signal, adapting a filter associated with distortion caused by speech coding, including quantization noise, in view of the estimation of background acoustic noise so that both background acoustic noise and distortion caused by speech coding, including quantization noise, are jointly reduced by the method. This feature of the present invention is disclosed in the application as filed, including page 3, line 33 through page 4, line 3.

It is asserted by the Office that despite the fact Atal does not disclose estimating background acoustic noise, Atal does disclose at column 9, lines 35-40, adapting a filter in response to the predicted acoustic noise to obtain an adapted filter. The referenced passage at column 9, lines 35-40 discusses a quantizing noise masking arrangement, but is totally silent with respect to background acoustic noise as required by claim 1. Consequently, the filtering performed by Atal is not suitable nor indicated as suitable for filtering background acoustic noise.

In Tasaki, a signal evaluator obtains background noise likeness by analyzing the decoded speech and the obtained value is made to be an addition control value. In the

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weighted value adder, when the addition control value appears to be the background noise likeness, the weight for adding to the decoded speech is reduced, the weight for adding to the transformed decoded speech is increased, and an output speech is obtained (Takasi, Abstract, Figure 1, column 8, lines 11-17). As seen in Figure 1 of Tasaki, the addition control value 35 from the background noise likeness calculator 15 merely adjusts the weighted value adder 18 (see variable adjustment arrows connected with the two amplifiers shown as part of the adder 18) so as to produce output speech 6. The addition control value 35 does not adjust a filter in response to estimated background acoustic noise to obtain an adapted filter as is specifically recited in claim 1.

Thus, like Atal, Tasaki also does not disclose adapting a filter in response to the estimated background acoustic noise to obtain an adapted filter and applying said adapted filter to said speech signal so as to reduce background acoustic noise and to reduce distortion, including quantization noise, caused by speech coding in said speech signal.

The Office in the Advisory Action of September 29, 2008 argues that Atal at column 9, lines 35-40 teaches the feature of prediction of noise. However, the prediction of noise in Atal is not acoustic noise, but rather quantizing noise in the formant portions of the speech spectrum in a time varying manner so that the quantizing noise is always masked by the changing speech signal formants. This has nothing to do with estimating background acoustic in a speech signal, wherein the estimating action is used for adapting a filter which is suited for reduction of distortion, including quantization noise, caused by speech coding as required by claim 1.

In the Advisory Action, the Office states that Tasaki mentions the use of a filter for using the estimated background noise and apply it to the speech signal (Tasaki, column 7, lines 37-46). Neither this portion of Tasaki nor the portions cited in the final Official Action disclose or suggest adapting a filter in response to the estimated background acoustic noise to obtain an adapted filter and applying said adapted filter to a speech signal so as to reduce background acoustic noise and to reduce distortion, including quantization noise caused by speech coding in the speech signal. There is no disclosure in Tasaki that the inverse filter 13 of the signal evaluator 12 which performs an inverse filtering of the decoded speech 5 supplied from the speech decoding unit 4 using the estimated noise

spectral parameter stored in the estimated noise spectrum updater 17 suggests anything more than the use of a filter for reducing background noise. It does not disclose or suggest the adapting of a filter in response to estimated background acoustic noise to obtain an adapted filter as required by claim 1.

Consequently, neither Atal nor Tasaki disclose or suggest estimating background acoustic noise for purposes of adapting a filter as required by claim 1.

As noted in applicant's Background of the Invention section of the present application, background acoustic noise in the state of the art is conventionally handled by separate noise suppression systems such as Wiener filters or spectral subtraction schemes and there is no suggestion in that art, including Atal and Tasaki, of adapting a filter suited for reduction of distortion, including quantization noise, caused by speech coding, in response to the estimated background acoustic noise.

For all of the foregoing reasons, it is therefore respectfully submitted that claim 1 is not suggested by Atal in view of Tasaki.

Because the combination of Atal and Tasaki do not suggest the invention of claim 1, it is respectfully submitted that claim 1 is in allowable form.

For the same reasons as those given for claim 1, it is respectfully submitted that claim 26 is in allowable form.

At page 10 of the Office Action, claims 15-17, 21, 26 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Atal in view of Tasaki and further in view of Ojala (WO 99/38155).

With respect to claims 15 and 32, it is asserted that Atal discloses a method of filtering speech signal, the method involving the steps of providing a filter suited for reduction of distortion caused by speech coding, predicting acoustic noise in said speech signal, adapting said filter in response to the predicted acoustic noise to obtain an adapted filter, and applying said adapted filter to said speech signal so as to reduce acoustic noise and distortion caused by speech coding in said speech signal. It is further asserted that Tasaki discloses estimating background acoustic noise. Atal in view of Tasaki do not specifically teach the use of a post filter controller, however, it is asserted that this feature is taught by Ojala, with reference made to page 8, lines 20-35.

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Apparatus claims 15 and 32 comprise features similar to claim 1 and are rejected in part based on the same combination of Atal and Tasaki cited with respect to claim 1. Ojala does not make up for these deficiencies in Atal and Tasaki and therefore it is respectfully submitted that claims 15 and 32 are in allowable form for the same reasons as those provided for claim 1.
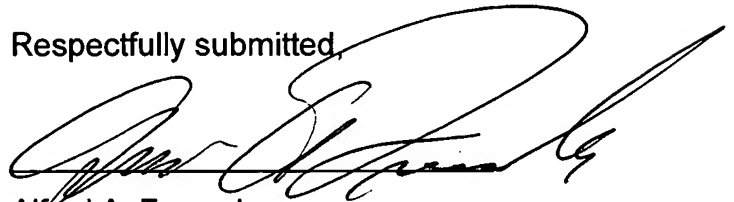
Dependent claims 2-14 and 16-21 are believed to be allowable at least in view of their dependency from independent claims which are believed to be distinguished over the cited art.

Since each of the claims is believed to be distinguished over the cited art, it is respectfully submitted that the present application as amended is in condition for allowance and such action is earnestly solicited.

Respectfully submitted,

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Alfred A. Fressola
Attorney for Applicant
Reg. No. 27,550

WARE, FRESSOLA, VAN DER SLUYS
      & ADOLPHSON LLP
Bradford Green, Building Five
755 Main Street, P.O. Box 224
Monroe, CT 06468
Telephone: (203) 261-1234
Facsimile: (203) 261-5676
USPTO Customer No. 004955